INVESTIGATING NURSES' DECISION MAKING IN ACTIVATING THE RAPID RESPONSE TEAM

by

Hannah Christensen

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by *Hannah Christensen*, titled *Investigating Nurses' Decision Making in Activating the Rapid Response Team* and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

_____ Date: April 26, 2019
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ACKNOWLEDGMENTS

There are numerous individuals for whom I am grateful, for furthering both this project and my endeavor to complete this degree. There were many times when I could not see the finish line, and I was continually pushed forward, and for that, I am exceedingly thankful.

To Dr. Shu-Fen Wung, thank you for not only agreeing to take on this project as my chair but continuously providing encouragement, advice, and invaluable input along the way. I truly appreciate the countless hours you spent for me to be successful in completing this project. I would also like to thank my committee members Dr. Laura McRee, and Dr. Sheila Gephart, for so graciously sharing your expertise and feedback on this project.

To the many nurses who have encouraged me and contributed to my education over the years, I am so thankful for you. These nurses include my friends, coworkers, classmates, preceptors, and the nurses who directly participated in this project. As cliché as it may sound, I am genuinely proud to be a nurse and belong to such an exceptional group of individuals.

To my family, I am also exceedingly thankful for your support and for continually putting up with me when I was stressed. Thank you for letting me vent at times, and continuously encouraging and uplifting me. I am especially grateful to my grandmother, Hattie Rouse, you were one of my biggest encouragers in starting this program. I will never forget the day you told me you were so proud of me for going after my dreams, and I wish you could be here to see the completion.

To my husband, Matt, I honestly could not have done this without you. You pushed me to pursue this degree and have stood beside me for all the ups and downs over the last three years. You have not hesitated to continue to encourage and comfort me, even when I know I was extremely unpleasant. I know that you have made so many sacrifices for me to be successful, and I am beyond blessed to be on your team.

DEDICATION

I want to dedicate this project to my grandmother, Lettie Jarrett, who inspired me to become a nurse. I don't know if I would have started down this path without the example of this strong, compassionate woman. I grieve that she hasn't been here to witness this adventure, but her legacy has lived on, and I am blessed to share this incredible profession and calling.

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ABSTRACT

Background: Patients experiencing cardiac arrest in hospitals often exhibit signs and symptoms of deterioration for hours leading up to the event (Franklin & Matthew, 1994; Schein, Hazday, Pena, Ruben, & Sprung, 1990). This issue has led to a focus on intervening before patients succumb to this event, and the creation of rapid response teams (RRTs) or medical emergency teams (METs) (Solomon, Corwin, Barclay, Quddusi, & Dannenberg, 2016). These teams have been recognized to produce significant reductions in both hospital mortality and in-hospital cardiac arrest (Solomon et al., 2016). However, RRTs are only effectual if there is recognition of patient need and activation of the RRT (Jackson, 2017). This knowledge makes it significant to investigate the factors and elements that are in involved in the decision making processes of nurses to activate the RRT.

Purpose: To investigate nurses' decision making processes in calling a rapid response, with the ultimate goal of increasing understanding and thus promoting better patient outcomes.

Methods: This project used a descriptive design, enabling nurses to share their experiences with RRT activation. A convenience sample of 10 registered nurses from a Medical-Surgical Oncology unit, ranging in experience from advanced beginner to expert, was interviewed utilizing a semi-structured interview tool derived from cognitive work analysis and Benner's theory of skill acquisition. Quantitative data were analyzed using descriptive statistics, while narrative data were analyzed through content analysis.

Results: A variety of resources influenced nurses' decisions to activate the RRT, including education and dynamics with other staff. There were also a variety of tasks associated with justifying an RRT activation, including patient assessment and implementing associated

interventions. Nurses also described strategies they utilize before activating the RRT, including seeking out assistance from other members of the team and activating a "code blue." The social system was also identified as a factor affecting RRT activation, although there were varying opinions on the state of unit culture. Nurses also described cues leading them to RRT activation, which was most commonly an abrupt change in patient condition. Nurses also described RRTs as highly beneficial for their patients, despite some identified challenges or negative aspects of RRT activation.

Discussion: The results of this project were consistent with the literature surrounding decision making to activate the RRT. This project's findings also indicate the need for further education in regards to RRT activation, including training on activation criteria, barriers to activation, and improving communication among team members. Future work to increase understanding of appropriate RRT activation may lead to timely RRT activations and better patient outcomes.

INTRODUCTION

Background

In the early 1990s, healthcare researchers uncovered a disturbing fact, patients experiencing cardiac arrest in hospitals were exhibiting signs and symptoms of deterioration for hours leading up to the event (Franklin & Matthew, 1994; Schein, Hazday, Pena, Ruben, & Sprung, 1990). This issue prompted a shift to focus on intervening before patients succumbed to this tragic event, and the creation of rapid response teams (RRTs) or medical emergency teams (METs) (Solomon, Corwin, Barclay, Quddusi, & Dannenberg, 2016). In 2004, the Institute for Healthcare Improvement (IHI) established the 100,000 lives campaign, calling for a drastic reduction of morbidity and mortality within the United States (U.S.) health care system (IHI, 2004). The very first intervention of this campaign was a directive to deploy RRTs in U.S. hospitals (IHI, 2004). Fortunately, hospitals across the U.S. took heed of this directive and RRTs are now well-established (Jackson, 2017). In 2010 at least 50% of U.S. hospitals reported having an RRT, and it is presumed that this percentage is even greater today (Solomon et al., 2016). The effectiveness of these teams is also being recognized, with the implementation of RRTs demonstrating significant reductions in both hospital mortality (Relative risk (RR) = 0.88, 95% confidence interval [CI]: 0.83-0.93) and in-hospital cardiac arrest (RR = 0.62, 95% CI: 0.55-0.69) (Solomon et al., 2016).

When considering these positive findings, it is essential to remember that RRTs are only effectual if there is a recognition of patient need and activation of the RRT (Jackson, 2017), which emphasized the need for this Doctor of Nursing Practice (DNP) project. When reflecting on this, it is important to consider another concept coined in the 1990s, the term “failure to

rescue" (Silber, Williams, Krakauer, & Schwartz, 1992). Although originally coined to describe death after surgery, the term "failure to rescue" is now defined as the failure to save a patient from a complication of illness or a complication of medical care (Agency for Healthcare Research and Quality [AHRQ], 2017). One example of a complication includes sepsis, an exaggerated bodily response to infection which can lead to organ damage and even death if not recognized and treated promptly (Lester, Hartjes, & Bennett, 2018). Furthermore, the idea of failure to rescue acknowledges that not every complication is preventable; however, failure to identify and treat complications when they occur is inexcusable (AHRQ, 2017). Aside from the devastating and even lethal effects of "failure to rescue" on patients, it is also a quality indicator now measured by the Centers for Medicare and Medicaid Services (AHRQ, 2017).

When considering the issue of RRTs and the decision making involved in their activation, it is essential to discuss the integral role of advanced practice nurses. This conversation is especially relevant to nurse practitioners working in the acute care setting, and particularly those who have a role in rapid response and code teams. The IHI only recommends a minimum of a critical care registered nurse (RN) and respiratory therapist (RT) to formulate an RRT (2008). However, acute care nurse practitioners are showing their worth in providing their expertise on RRTs, which may further their utilization in this role (Kapu, Wheeler, & Lee, 2014). Advanced practice nurses also serve as role models and educators to nursing staff, and a greater understanding of nurses' decision making processes in activating the RRT may lead to more effective educational interventions.

Local Problem

The setting of this DNP project has an established RRT, formerly known as the Clinical Assessment Team, consisting of an Intensive Care Unit (ICU) RN, Nursing Supervisor, and an RT. Adult and pediatric teams are in place, with an adult ICU RN responding for adult patients, and pediatric ICU RN responding for pediatric patients. This project studied the adult RRT team, in line with the purposes of this project. A policy is also in place within the facility outlining the purpose and procedures of the RRT. The purpose of the RRT is to provide clinical resources to nursing staff for patients with changing or declining physical condition. The policy states that the RRT should be called primarily when a staff member is "worried" or a "patient does not look right." Additionally, any acute change in heart rate, blood pressure, respiratory rate, oxygen saturation or mentation may also warrant calling the RRT. Activation takes place by calling the hospital operator and requesting an RRT to a room location.

Despite the existence of an established team and policy, stakeholders within the institution including ICU leadership identified a need for continuous improvement in the area of RRT activation. This improvement included investigating the appropriateness or lack of RRT activations according to the institution's RRT policy. Notably, the organization does not incorporate an early warning system (the Modified Early Warning System [MEWS]). MEWS is a tool utilizing multiple parameters including respiratory rate, heart rate, systolic blood pressure, conscious level, temperature, and urine output to provide a score indicating a patient's need for intervention (AHRQ, 2018). The lack of such a warning system further supports the need for appropriate RRT activation.

Purpose and Objectives

The purpose of this project was to investigate nurses' decision making processes in calling a rapid response, with the ultimate goal of increasing understanding and promoting better patient outcomes. In doing so, one objective was to collect data from medical-surgical nurses on their experiences activating the RRT. A second objective was to analyze the information and data gleaned from these nurses and identify themes and patterns in nurses' decision making. Finally, those involved in the care of patient populations affected by the RRT are the target audience for dissemination. This audience principally includes nurses, thus leading to more timely identification of patients in need of intervention by the RRT, preventing failure to rescue and promoting positive patient outcomes.

In considering the purpose and objectives involved in the project, it was imperative to consider key stakeholders. In this case, there were multiple stakeholders to consider including nurses, providers, code team members, organizational leadership, patients, and families. Bedside nurses were the primary stakeholders as they are often the individuals recognizing the need for RRT activation and also the primary subject of this project. Providers were considered as well, especially hospitalists and those working on code teams. It was also significant to contemplate the organization involved and leadership within the organization. Finally, patients and their families are stakeholders and worthy of consideration, as patient care is directly affected by the work of RRTs.

Study Question

The study question answered by this DNP project is: What factors and elements are involved in the decision-making process to activate the RRT by medical-surgical nurses?

THEORETICAL FRAMEWORK AND SYNTHESIS OF EVIDENCE

Theoretical Framework

Two theoretical frameworks were used to guide this project, cognitive work analysis and Benner's theory of skill acquisition (Jenkins, Stanton, Salmon, & Walker, 2009; Naikar, 2013; Snowden, Donnell, & Duffy, 2014). Cognitive work analysis is a framework for analyzing, designing, and evaluating the multiple facets of complex systems, encompassing five domains comprised of resources, tasks, strategies, social system, and worker competency (Jenkins et al., 2009; Naikar, 2013). This theory, initially described by Danish researchers in the 1960s, is derived from open systems theory, sociotechnical systems theory, and complexity theory (Braaten, 2015; Jenkins et al., 2009). Cognitive work analysis has been utilized by Braaten (2015) to define factors influencing nurses' decision making in activating an RRT.

Cognitive Work Analysis

In further describing cognitive work analysis, within this methodology is the premise that individuals and events are uncontrollable; however, it is crucial to understand the boundaries, possibilities, and barriers within a system (Braaten, 2015; Jenkins et al., 2009; Naikar, 2013). A key term in cognitive work analysis is constraints, which are boundary conditions shaping individuals' behavior and decision making processes; furthermore, modifications to these constraints can be utilized to enhance workers' achievements (Braaten, 2015; Naikar, 2013; Jenkins et al., 2009). The five constraints within cognitive work analysis are resources, tasks, strategies, social system, and worker competency (Braaten, 2015; Naikar, 2013). These constraints were utilized to guide this project.

The first constraint, resources, involves the work domain as well as purposes, values, priorities, and functions in the system (Naikar, 2013). In the case of nurses' decision making to activate an RRT, analyzing resources involves determining what elements of the work environment support calling the RRT (Braaten, 2015). The next constraint is tasks, also known as control task analysis, which includes problem-solving or decision making taking place on the subject of concern (Naikar, 2013). For this project, examining tasks involves determining what a nurse accomplishes before activation of an RRT (Braaten, 2015). The third constraint is strategies, defined as the multiple pathways an activity can be completed (Naikar, 2013). In regards to decision making in activating an RRT, this involves exploring the strategies available for activating an RRT (Braaten, 2015). The next constraint is the social system or social organization and involves how nurses organize and issue work (Naikar, 2013). In this case, it is essential to consider what social norms influence the activation of an RRT, and from experience, this author suspected this would be a major focus of this project (Braaten, 2015). The final constraint is worker competency, which involves the competencies required of workers to perform their work efficiently (Naikar, 2013). Specifically, this involves the competencies needed to activate an RRT, making it important to consider Benner's theory of skill acquisition (Braaten, 2015, Snowden et al., 2014).

Benner's Theory of Skill Acquisition

To accompany cognitive work analysis, Benner's theory of skill acquisition focuses on elements of nursing practice, particularly nursing experience, behaviors, and decision making (Snowden et al., 2014). Patricia Benner's theory was developed from a study in experiential learning and developing nursing expertise, and first described this in her 1984 work, *From*

Novice to Expert: Excellence and Power in Clinical Nursing Practice. Combining these theories, cognitive work analysis and Benner's theory of skill acquisition, provided a greater comprehensive approach and solid foundation for this project, by analyzing and evaluating both the healthcare system and nursing practice.

Benner's theory emphasizes the importance of experience and reflective thinking in developing nursing expertise, defining five levels of ability from novice to expert (Snowden et al., 2014). Novices have no real experience of situations and function by following rules, in addition to having limited actions and requiring assistance in determining the relevance of tasks (Snowden et al., 2014). However, once nurses have progressed to experts, they possess experience and intuition to understand situations and do not primarily rely on guidelines (Snowden et al., 2014). Additionally, experts are both proficient and flexible in their performance (Snowden et al., 2014). Benner's theory was utilized in this project as a framework to evaluate how nurses' experience levels related to their performance and decision making to call an RRT. This theory also informs the process of nurses progressing from novice to expert, an important concept to consider in regards to nurses' recognition of patient deterioration and activation of an RRT (Snowden et al., 2014).

Concepts

In exploring the concepts and definitions within this proposed project, it is crucial to revisit the purpose of this project. The purpose of this project was to investigate nurses' decision making in calling a rapid response, to understand the process and promote better patient outcomes. It is first essential to define the concept of a rapid response further. A simple definition is that a rapid response system involves the rapid evaluation and intervention to a

patient actively experiencing clinical deterioration in the acute care setting (Jackson, 2017). Additionally, rapid response systems are comprised of two key functions (or limbs): recognition of patient need (known as the afferent limb), and the initiation of the rapid response (the efferent limb) (Jackson, 2017; Winters et al., 2015). It is crucial to recognize the goal of the rapid response intervention, which is to improve patient outcomes, especially on a short term basis (Jackson, 2017).

Another concept to consider is the RRT itself. RRT composition varies by institution but is typically composed of at least an Intensive Care Unit (ICU) RN and RT, conforming with IHI guidelines (2008). RRTs may also include other significant members such as a nursing supervisor, pharmacist, or provider (Jackson, 2017). It is also important to note that the patient's primary RN is a crucial member of the RRT, possessing the most substantial knowledge of the patient and events leading to deterioration (Jackson, 2017). Although not noted in the literature, this author has observed that other staff members are often dispatched to rapid response events as well, including security, chaplains, and phlebotomists.

For this project, another important concept to consider is the activation of the rapid response, or as previously noted, the afferent limb (Winters et al., 2015). Institutions with rapid response systems should have protocols in place with criteria for activating an RRT (Winters et al., 2015). Rapid response activation criteria typically include abnormal vital signs, change in condition, or a concern by a staff or family member (Winters et al., 2015). Recognition of these criteria should result in triggering the bedside clinician to activate or call the team for help (Winters et al., 2015). Activating the team may involve paging the team members overhead, sending a message to a portable electronic device, or a combination of both. It is important to

note that recognition of deterioration is a critical component of a rapid response system, and absence of this element will not result in a rapid response or activation of the team (Winters et al. 2015). This idea formed the critical point of this study, which was to investigate the decision-making process for activating an RRT.

Synthesis of Evidence

Completing multiple searches of the literature was necessary for striving to understand nurses' decision making in activating the RRT. These searches utilized three databases, PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Embase. The search terms used to identify articles were: rapid response, medical emergency team, activate, call, and decision. Inclusion criteria for the articles were those published within 10 years, English language, and humans. Excluded articles included those with non-nurse study participants, those not relating to the activation or call of the rapid response, and those only referring to family-activated rapid responses. Fifteen articles relevant to the purpose of this DNP project were identified (Table 1).

TABLE 1. *Synthesis of evidence.*

Author / Article	**Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question**	**Theoretical Framework**	**Design**	**Sample (N)**	**Data Collection (Instruments/Tools)**	**Findings**
Astroth, K. S., Woith, W. M., Stapleton, S. J., Degitz, R. J. & Jenkins, S.H. (2013).	Qualitative: To identify barriers and facilitators to nurses' decisions regarding activation of rapid response teams (RRTs) in hospitals.	None	Convenience sampling	15/81 nurses employed in 155-bed community hospital	Structured interview questions	<u>Facilitators:</u> RRT Characteristics: Expertise of RRT to manage ill patients The team is supportive and provides immediate assistance Appreciate mentoring and emotional support Unit culture: Support and encouragement from unit colleagues and leaders, most not aversive to calling. Perceived positive outcomes from calling. <u>Barriers:</u> RRT Characteristics: Some communication by RRT member unsupportive, including body

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						language and method of questioning. Team members complaining about the call. Perceived busyness of ICU. Unit culture: Appearing dumb – particularly in inexperienced nurses. Believing it can be handled by themselves, only call if no help available. The belief that the physician should be called first. The belief physicians will be upset if not called first. Educational factors also emerged, but not clearly facilitators or barriers – gaps in receiving education, awareness of policy, response time,

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						supplies needed. Limitations: Small sample in one institution, only nurses who activated RRT, previous education in the institution on RRT unknown
Bagshaw, S. M., Mondor, E. E., Scouten, C., Montgomery, C., Slater-MacLean, L., Jones, D. A., Bellomo, R., & Gibney, R. T. N. (2010).	Quantitative: To evaluate nurses' beliefs and behaviors about the Medical Emergency Team (MET) system, three years after implementation. 1. Whether the nurses understood the potential benefits of the MET. 2. Whether nurses found the MET system useful when managing sick patients on	None	Survey	614 nurses employed on units participating in the MET system, 293 (47.7%) were approached and 275 completed the survey (response rate, 93.9%). 84% RNs and 16% LPNs. 48% Surgical and 52% Medical	Single one-day surveillance, nurses to participate at the change of shift. 19 item questionnaire, including demographics and level of experience. Pilot tested with a small focus group	Barriers: Fear of criticism, belief that a physician should be called first. Beliefs about if it is beneficial and helpful: 84% believe it could prevent cardiopulmonary arrest, as well as prevent minor issues from becoming major life-threatening problems. 94% believe helpful to obtain help

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
	the unit. 3. Whether nurses faced obstacles to activating the MET. 4. Whether nurses believed that particular patient and/or system-related factors resulted in patients needing the MET. 5. Under what circumstances the nurses activated (or did not activate) the MET. 6. Whether nurses believed that the MET affected either their abilities or their skills for managing sick patients outside the ICU.					Beliefs about activation: 75% disagreed that they were reluctant to call for fear of criticism. 15.4% stated reluctant to call for fear of criticism. 76% stated they would call physician first, 75% of those would call if unable to reach physician. 15% reluctant to activate if physician unaware,10% would not call if physician unaware. Beliefs about RRT with normal VS: 48% agreed they would call if worried despite normal VS. 27% uncertain, 20% would not call if VS normal.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						Beliefs about why it is required: only 3% believe it is needed because management by nurses is adequate. 7.5% stated inadequate management by physicians, 15.7% unsure why it is required. Beliefs about impact of RRT on skills: 81% disagreed that MET increased workload, 91% disagreed that MET reduced skills for caring for sick patients. 27% unsure of impact. 48% believed MET
Braaten, J. S. (2015).	Qualitative: To describe factors within the hospital system that shape medical-surgical	Cognitive work analysis	Qualitative descriptive	12 nurses from medical-surgical	Interviews	1. RRT dependent on human resources – staffing, others in the unit,

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
	nurses' RRT activation behavior					assessment of gradual or sudden changes, family member presence 2. RRT requires the act of justification – the use of decision ladders, triggers 3. The availability of multiple strategies for addressing subtle changes can delay activation – calling for orders versus immediately call RRT, seek more info, use existing protocols 4. Informal social rules influence activation – calls for abrupt changes socially acceptable. With subtle changes, fear of looking "dumb", fear of

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						upsetting physician, trying to handle it. Hierarchal structure also influences 5. Subtle clinical changes require increased competencies to justify activation; abrupt changes are more likely to lead to activation <u>Limitations:</u> small sample and one institution, mostly day shift nurses, mostly experienced (all >5 years of experience), volunteers only

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Chua, W.L., See, M. T. A., Legio-Quigley, H., Jones, D., Tee, A., & Liaw, S. Y. (2017).	Quantitative and Qualitative: To synthesize factors influencing the activation of the RRT and explain suboptimal RRT activation by nurses and newer physicians	None	Systematic review	Ward nurses and junior physicians (residents, medical officers and house officers), working in general ward settings.	Primary studies in the English language, published between 1995 and 2016. Studies appraised using the Critical Appraisal Skills Programme for qualitative studies, Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review instrument for quantitative studies, Mixed Methods Appraisal Tools for Mixed-Method studies. 30 studies were included in the review	Study Characteristics 14 from United States, 10 from Australia, 2 from United Kingdom, 1 each from Canada, Finland, Greece, and Italy. 19 acute and tertiary care, 4 community hospitals, 7 mixed settings. Median sample size 32 for qualitative studies, 246 for quantitative studies. Median 407 medical record reviews and median 10 participants for mixed-methods studies. Population of studies: 16 ward nurses, 1 physician, 7 nurses and physicians, 4 mixture of healthcare professionals, and 2 general ward

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						patients. 15 quantitative, 12 qualitative, 3 mixed methods. Most were quantitative self-administered surveys (n=12). <u>Quality Assessment</u> medium quality (n=18), high quality (12) <u>Synthesis</u> Factors influencing RRT activation: 1) Person – nurses and junior physicians; RRT activation affected by perceptions of the benefits and downsides of RRT, clinical expertise, and support from colleagues and leadership.

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						2) Tools and technologies – apprehension about ability of tools and technologies to support early recognition of patient deterioration and RRT activation, particularly sensitivity and specificity of activation criteria and limits of monitoring technology. 3) Tasks – seeking justification and affirmation, deliberating reactions from the RRT, considering workload and staffing. 4) Organization – adherence to traditional model of care escalation

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						and staff education influence utilization of tools and technologies Limitations: exclusion criteria may have ruled out studies with insight, most quantitative studies were cross-sectional surveys only providing information on a single point in time, variations in RRT implementation across studies, lack of data on RRT activation rates.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Davies, O., DeVita, M. A., Ayinla, R., & Perez, X. (2014)	Quantitative: To identify barriers associated to activation of the RRS system by clinical staff.	Theoretical model of knowledge, attitude, behavior	Survey	Physicians and nurses on Medical-Surgical wards of a NY city hospital – 68 physicians, 16 nurses. 286 bed hospital, level 1 Trauma	Survey – Likert scale, self-administered. Assessing adherence to six triggering criteria for activation Knowledge: rate familiarity with triggering criteria Attitudes: level of agreement with criteria and perceived benefit	Familiarity: most familiar with mental status change (76%) Agreement: most agreed with RR criteria (86%) Perceived benefit: RR (91%) Unfamiliarity with criteria largest barrier – (24-35% unfamiliar with all criteria) Self-adherence $\underline{\leq}$25% for the six RRT criteria Triggering for AMS the least percentage of barriers, triggering for spO2 with highest percentage of barriers

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						Potential barriers and activation: familiarity and agreement with as well as perceived benefit increases adherence rate Limitations: Mostly physicians, mostly trainees. Additionally, only one setting, based on self-report
Jackson, S., Penprase, B., & Grobbel, C. (2016).	Quantitative: To examine beliefs and behaviors that influence registered nurses' decision to activate an adult rapid response team in a community hospital Questions: 1. What are the beliefs and attitudes of RNs on and barriers to	None	Survey	163 nurses, out of 343 eligible (48% response rate), 58% from Medical-Surgical/Telemetry, 31% from Peripartum, 11% from Psychiatric. 72% Bachelor's degree. 77% had activated an RRT	17 item Likert style instrument	RRT barriers: Disagreed that there was reluctance to call because of criticism that patient was not sick (70.5%) Disagreed that there was reluctance to call RRT for fear of criticism of not caring well enough (86.4%)

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
	utilizing an RRT? Is there a difference in beliefs and attitudes on and barriers to utilizing an RRT between RNs employed in different areas? 2. Is there a relationship between years of experience and intent to activate an RRT by RNs in a community hospital?					RRT on workload: disagree that it is overused (90.8%), disagree that increases workload (80.1%) Skills for managing patients: 96.9% disagree that RRT decreases skills <u>RRT positive/intent to activate:</u> RRT prevents cardiopulmonary arrest: 88.3% RRT prevents minor problems from becoming major problems: 89.6% Disagree that RRT is not helpful in managing sick patients: 90.8% RRT would be called if unable to reach physician: 79% RNs call physicians before activating an

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						RRT: 71.2% If VS normal, RRT should still be called: 62.7% If patients look well but meet criteria RRT should still be called: 65% <u>Patient management beliefs:</u> Disagree with RRTs are required because the management of patients by nurses is inadequate: 88.9% Disagree that RRTs are required because management by physicians is inadequate: 70.6% <u>Limitations:</u> convenience sample, education level (Most baccalaureate), single institution)

TABLE 1 - *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Jenkins, S. H., Astroth, K. S., & Woith, W. M. (2015)	Quantitative: 1. What factors do nurses believe serve as facilitators and barriers to activation or RRTs? 2. What is the relationship of selected demographic characteristics, such as experience and education, with perceived facilitators and barriers to activation of RRTs?	Social judgment theory, Lens model of cognition	Exploratory design, survey with convenience sample	50 nurses from non-critical care units. 92% Women with average age 40.28 years. Highest degree Masters (12%), most participants baccalaureate level (66%). 20% with less than 5 years of experience, 50% more than 10 years of experience.	Secure online survey, 32-items called "The Rapid Response Team Facilitators and Barriers Survey" (RRT-FBS). Items based on previous qualitative study of nurses' decision making when activating RRT (Astroth et al., 2013)	<u>Nursing Unit Culture</u> 96% believe that RRT brings help more quickly and facilitates transferring seriously ill patients to a higher level of care. 90% believe that RRT decreases code blues. 92% Agree that unit leadership and other nurses support calling the RRT. 94% agree that patients benefit from RRTs. 90% agree that other nurses on the unit help out when a nurse is tied up with an RRT. 12% state that they fear that calling the RRT indicates an inability to care for patients. 46% believe that nurses with less

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						experience are more likely to call RRT. 25% that nurses with more experience are more likely to call RRT. However, older and more experienced nurses believe that experienced nurses are more likely to call RRT (p=.02 and 0.14 respectively). <u>RRT Member Characteristics</u> 70% agree that RRT members have more expertise in managing seriously ill patients. Years of experience correlated with believing the RRT members were better at assessing patients (r=.3, p=.035). Age and years of experience also correlated with

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						believing that RRT member were better at explaining a patient's condition to the physician (r=.329, p=.02 and r-.454, p=.001, respectively). 72% agree that RRT members treat unit nurses with respect 75% agree that members of the RRT will be supportive to nurses who call 12% agree that they expect ICU nurses on RRT to be condescending, 8% agree that they believe the ICU nurses will think the call was unnecessary <u>RRT Knowledge</u> 84% agree that they know when they should call the RRT.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						71% agree that they know their roles during the RRT. 76% agree that they understand hospital RRT policy. 22% agree that they receive regular education on RRT. 10% believe that the physician should be called before calling the RRT. Limitations: convenience sampling was used, and participants were predominantly female. In addition, the authors only reported limited information on the significance of their results. The instrument used was also new and not validated in other settings.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Kitto, S., Marshall, S. D., McMillan, S. E., Shearer, B., Buist, M., Grant, R., Finnigan, M., & Wilson, S. (2015).	Qualitative: Participants' experiences of rapid response systems (RRS) in addition to exploring social and cultural factors mediating the usage of the RRS	Collective competence and interprofessional conceptual framework	Exploratory case study – multiple case study framing. Senior nurses recruited by email, junior nurses recruited through snowball sampling. Medical staff recruited individually.	27 doctors, 62 nurses participated. No other demographic information reported.	Focus groups – ten across four hospitals. Directed content analysis used to explore participants' experiences with the RRS and social, professional, and cultural factors mediating RRS usage. Conventional content analysis and complementary directed content analysis used to formulate and explore major themes.	<u>RRS Characterization</u> A preventative process for gaining support and managing a deteriorating patient. Standardized RRS criteria in place, however participants unable to provide details, and informal criterial and protocols also in place. Physicians also have the ability to change criteria. <u>Definition of a missed RRS call</u> Not including instances where local support was sufficient to care for the patient. Missed RRS calls do occur when an individual does not activate due to a breakdown

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						in communication. Missed calls also view as individual mistakes instead of system error. Missed calls also result as a consequence of past "incorrect" calls. <u>Intraprofessional Factors</u> Clinical judgment is used in conjunction with RRS criteria to guide assessment and decision making to activate the RRS. Nursing approach – hierarchal and protocol based. Physician approach – autonomous medicine based on clinical judgment. Nurses perceived to over call, while junior medical staff under call.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						Perception that RRS "de-skill" junior medical staff by taking away learning opportunity. <u>Interprofessional Factors</u> Collaboration and Communication factors in decision making to call RRT, horizontally across professions and vertically through hierarchy. Frustration with individuals being intimidated to activate the RRS through fear of negative repercussion. Doctors and nurses place in position to balance the needs of the patient with their professional position, causing

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						tension. <u>Formal "work-around"</u> RRS is activated when communication and collaboration break down, a formal way to get additional support and assistance.
Leach, L. S., Mayo, A., & O'Rourke, M. (2010).	Qualitative: Explore and describe the nurses' role in rescuing patients in the context of having participated in an RRT intervention	Grounded theory approach	Purposeful sampling through semi structured interviews	50 participants from 6 acute care hospitals in Northern California. 14 bedside staff RNs, 16 RRT RNs, 2 respiratory therapists, 18 nurse supervisors	Digitally recorded interviews	<u>Process and RN decision making</u> RNs' role is activating and calling the RRT. A variety of patient changes act as cues for the decision to call, including VS, mental status. Less objective clues also used such as intuition. Hospital protocol also plays a factor. Decision to activate the RRT made by "thought

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						decisions," followed by "enactment decision" and finally "operational decision". RN decision making and RN role within rapid response interventions also discussed but not in the context of this project. Limitations – small sample when considering the size of the population. Also, bedside nurses were a small portion of the sample.
Massey, D., Chaboyer, W., & Aiken, L. (2014).	Qualitative: Explore nurses' experiences and perceptions using and activating a MET	None	Semi-structured interviews of a consecutive sample. Nurses recruited by reviewing unplanned ICU transfers. Themes developed through inductive approach.	15 nurses who cared for patients on the ward who had an unplanned transfer to ICU in one Australian teaching hospital. Mean experience 5 years, ranging	Interview guide developed from literature and discussion by team utilized, Interviews recorded and transcribed	Themes: Sensing Clinical Deterioration Characteristics used to identify physiological decline – frequently vital signs.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				from 6 months to 22 years of experience.		<u>Resisting and hesitating</u> Refusing or hesitating to call the RRT. This was the result of being unsure, anxiety of looking like "an idiot", or being reprimanded. Participants also intimidated by the MET and feared "being told off." Participants spoke about past experiences in which they were reprimanded by MET members, resulting in negative feelings. <u>Pushing the button</u> Participants reacting to the deteriorating patient by making effort to

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						access help and support, also tactics utilized to justify not activating the MET. The button as an actual emergency button activating the cardiac arrest team, separate from the MET. Confusion existed on when to activate the cardiac arrest team versus the MET. Participants also did not view MET as an early intervention strategy, leading to a delay in activation. <u>Support and leadership</u> Important factors in supporting or hindering activation. Participants stated that a clearly identified leader leads to an organized and less

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						chaotic approach. Participants also frequently sought support and advice on activating the MET from peers and leadership, delaying activation. Additionally, "packaging" clinical deterioration was identified as a factor, which depended on knowledge, confidence, and experience. <u>Limitations:</u> One site, small sample size and retrospective approach which limits generalizability. Participants were also interviewed in light of an adverse event and at the end of their shift, impacting quality.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Pantazopoulos, I., Tsoni, A., Kouskouni, E., Papadimitriou, L., Johnson, E., & Xanthos, T. (2012).	Quantitative: Evaluate the relationship between nurse demographics and correct identification of situations warranting nursing action, including activation of the MET	None	Quantitative Descriptive	150 randomly selected nurses in general medical-surgical wards at a tertiary hospital in Athens, Greece. 94 responded (62% response ratio). 75.5% Women, mean age 36.9, 79.7% graduated from a four-year program, 5.3% with Master's degree, 2.2% with a Doctorate, 83% bedside nurses, 63% on medical ward, 93.6% basic life support (BLS) providers.	Survey with 13 multiple choice questions, derived from European Resuscitation Council (ERC) Guidelines for Resuscitation 2005. Pilot tested by 30 nurses from another hospital and three professors to assess validity. Test-retest was also used to assess reliability.	Participants who graduated from a four-year program more accurately identified clinical situations necessitating MET activation ($p=0.031$). Four year graduates also scored significantly higher on theoretical knowledge questions ($p=0.0002$). Participants with less than five years' experience would activate MET at a higher rate than those with over 15 years' experience when encountering foreign body airway obstruction ($p=0.008$). Participants with BLS training knew how to respond correctly to patients

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						experiencing foreign body airway obstruction and also correctly activate MET for patients with bradycardia in comparison to those without training (p=<0.05). Clinical situations that posed the greatest nursing concern and led to activation of MET were patients with foreign body airway obstruction, RR <5/min, HR <40/min, HR 100/min, and atypical chest pain. Limitations: sample size, participants may be likely to give correct answers as opposed to quality answers

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Parker, C. (2014)	Quantitative: "Does the decision-making model used by nurses to activate the RRT influence the frequency of RRT activation?	Information processing and intuitive-humanistic theories	Descriptive, Cross sectional correlational quantitative	87 nurses from three hospitals in southeast Florida. 91% female, 63% baccalaureate or higher, average time working 9.6 years (SD 8.3). 9.2% had specialty certification, 67.8% day shift, 28.7% night shift.	Questionnaire: Nurse Decision Making Instrument (NDMI). 24-items categorizing the decision model used as analytic, analytic/intuitive (mixed), or intuitive.	Number of RRT calls made in the preceding 12 months: 1-15 (mean=3, SD=2.6). NDMI scores: 41-103 (mean=69.5, SD = 9.6). Mixed decision makers: 70.1% (n=61), analytical decision makers: 21.8% (n=19), intuitive decision makers:8% (n=7). Decision making model and frequency of RRT activation (over 12 months): Analytical mean=4.7 (SD: 2.1), Intuitive mean=2.3 (SD: 2.1), Mixed mean=2.6 (SD 2.5). Differences in

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						frequency of RRT activation across the 3 groups was significant (p=0.003). Covariates with significant interaction with decision making model and frequency of RRT activation: age, years of RN experience, length of time in current unit (p<0.05). RNs with analytical decision making were older, with more years of nursing experience, longer time on the unit than those with intuitive or mixed decision making. <u>Limitations:</u> sample size, unclear which units nurses worked

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						on or if they were representative of the unit, only included full-time nurses working for at least 1 year, participation rate not disclosed, no data on frequency of actual RRT activation.
Shapiro, S. E., Donaldson, N. E., & Scott, M. B. (2010).	Mixed Quantitative and Qualitative: "What did staff nurses experience before, during, and after they activated the rapid response team?" "What did the nurses report was the impact of the team on their practice?" "From the nurses' perspective, what were some of the characteristics of a successful rapid response team?"	None	Mixed Quantitative and Qualitative, article focuses on qualitative data from interview	56 nurses from 18 hospitals across 13 states. Average number of years as an RN: 14.15 (SD=5.26, median=5). Number of years on the unit: 8.91 (SD=3.50, median=4). Nurses from a variety of settings including medical-surgical, step-down, outpatient procedural. Hospitals included 9 teaching	Semi-structured interviews in focus groups were recorded and transcribed. Thematic analysis utilized, data read and coded into categories.	<u>Experiences of nurses activating the RRT:</u> Why was the team activated: patient exhibited signs and symptoms that were unexpected of significant from baseline, the nurse had a "gut feeling" something was wrong, the nurse believed the patient needed and immediate evaluation and the physician was unable to respond in

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
	"From the nurses' perspective, what where the challenges associated with activating a rapid response team?"			hospitals and 9 nonteaching hospitals, average capacity 346 beds.		the time though necessary What did the team bring to the bedside?: additional expertise and resources, including invaluable expertise, physicians listened better to RRT nurses, RRT expedited care for patients with urgent needs. How did the activating nurses feel about the experience?: initially felt "concerned" about the patient, "frustrated" they could not get the physician to respond, "uneasy", "stressed", "nervous", "anxious", sense of "needing to check"

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						on the patient. On team arrival, felt "relieved," "good," "confident" that needs were addressed, and comforted by help to ensure patient safety. After team left, felt "glad," "relieved," "affirmed," "encouraged" by the positive outcome, would be likely to use the team again. <u>Characteristics of successful implementation:</u> Robust-adopters: nurses do not hesitate to activate the RRT, no fear of repercussions. Evidence of tangible support by administration.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						Reluctant adopters: nurses weren't certain when to activate RRT rather than call a "Code Blue" or follow chain of command, concern for reprimand. Concepts of individual inertia and institutional inertia. <u>Challenges encountered:</u> Direct: knowing when to activate the RRT versus code team, problems in chain of command Indirect: concern about the nurse's other patients during the rapid response, staffing in the ICU during the call.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						Limitations: sample size, high average number of years as an RN and on the unit.
Williams, D. J., Newman, A., Jones, C., & Woodard, B. (2011).	Qualitative: To describe the perceptions of nurses utilizing the RRT at a community hospital	None	Qualitative, focus group	13 staff RNs employed in medical, medical-surgical, cardiac care, and observation units in 156-bed community hospital. 100% women, average 12 years of nursing experience, average 5 years at the hospital. 6 staff nurses, 2 nurse clinicians, 6 supervisors/educators. Education: 2 diploma, 7 associate, 3 baccalaureate, 2 master's.	Focus group with 15 question topic guide targeting nurses' experiences with RRT activation and composition, advantages and disadvantages of RRTs, rational and concerns about activating the RRT. 6 1-hour focus groups over 2 week period, participants chose any session to attend.	Individual nurse: 1. Developing knowledge: RRTs are a learning tool enhancing nursing skills 2. Benefiting patients: Helping patients deteriorating the greatest take advantage of the RRT 3. Experiencing autonomy: RRT as a nurse-driven action and expansion of autonomy, empowering nurses 4. Using intuition: nurses use a "gut feeling" to

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				All but one participant worked full time		activate the RRT. 5. Using intuition: nurses use a "gut feeling" to activate the RRT <u>The team:</u> 1. Solving problems collaboratively: teamwork occurring between nurses and the RRT, sharing ideas and tasks. Negative reactions from the RRT make nurses reluctant to activate the RRT. 2. Appraising team members: nurses' evaluation of RRT in terms of member characteristics and behaviors, feedback, and RRT members shaping of nurses' experience.

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						3. Generally satisfied with RN led RRTs, believe RRT outcomes related to skills and experience of RRT members responding. Believe group composition personalities, and actions matter during RRT calls. Nurses want to be engaged with the RRT. <u>System:</u> 1. Working around people and processes: RRT as a way to work around barriers to delivery of care. 2. Advocating for patients and their safety: RRTs a way to advocate, support, watch

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						over patients, and utilize resources to provide safe care. Limitations: small sample, did not report if it was representative of the hospital, convenience sample, study team member known to participants.
Wynn, J. D., Engelke, M. K., & Swanson, M. (2009).	Quantitative: "What is the relationship of education level and the reason for the RRT call?" "What is the relationship of years of experience and reason for the RRT call?" "What is the relationship of engagement and reason for the RRT call?"	None	Descriptive, cross-sectional, correlational	75 staff nurses on adult general and intermediate care units from an academic hospital in North Carolina. Mean age 38 (SD 9.38), 89.3% female, 66.7% Caucasian, 12.2% African American, 60% ADN prepared, 40% BSN prepared, 64% with >3 years nursing	Tools: 1. Manifestations of Early Recognition (MER) scale: 16-item self-report assessing attributes of nurses working together in relation to early recognition. 5-point Likert-type scale. 2. RRT Questionnaire: 25-item self-report tool collecting information on	183 RRT calls during study period, 70% of nurses returned the survey. MER scale: mean score 63.6 (SD 9.25, range 38-80) Top 3 reasons for calling RRT 1. "sudden change in patient condition" (selected by 78% of respondents)

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
	"What is the relative contribution of each variable controlling for the influence of the other?"			experience.	3. nurse factors including education, experience, work environment. Pre-RRT Patient Condition Tool: Instrument to collect pertinent data on patient condition prior to RRT call RRT Documentation Tool: Instrument to collect information on events occurring during RRT intervention	2. "steady decline in patient condition" (selected by 56%) 3. "inadequate response from physician" (selected by 35%) 73% of patients had clinical changes documented before the RRT call, 16% as long as 8 hours before RRT activation, 37% as long as 2 hours before RRT activation. <u>Educational level and reason for RRT call:</u> ADN nurses: 47% of cases, RRT activated at the request of another nurse or physician BSN nurses: 23% of

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						cases, RRT activated at the request of another nurse or physician (p=0.03) <u>Nursing experience and reason for RRT call:</u> <u>≤</u>3 years of experience: in 56% of cases, RRT activated at the request of another nurse or physician >3 years of experience: in 27% of cases, RRT activated at the request of another nurse of physician (p=0.01) <u>Staff nurse reason for RRT activation and degree of engagement:</u>

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						1. Nurse called RRT at the request of another nurse or physician: lower engagement scores (mean=60.5, SD=10.89) 2. Nurse called independently: significantly higher engagement scores (mean=65.6, SD=7.72 <u>Relative contribution of educational lever, experience, degree of engagement and probability of nurse calling independently:</u> educational level (p=0.01) and nursing experience (p=0.04) independent

TABLE 1 – *Continued*

Author / Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						predictors of call status when controlling for the effects of other independent variables. Independent callers nearly 5 times more likely to have a BSN and almost 4 times more likely to have > 3 years of nursing experience. <u>Limitations:</u> generalizability related to sample size and demographics

Many of the existing studies discussed the barriers and facilitators to activating the RRT (Astroth, Woith, Stapleton, Degitz, & Jenkins, 2013; Bagshaw et al., 2010; Chua et al., 2017; Davies, DeVita, Ayinla & Perez, 2014; Jackson, Penprase, & Grobbel, 2016; Jenkins, Astroth, & Woith, 2015; Parker, 2014; Shapiro, Donaldson, & Scott, 2010). Some of these barriers included unsupportive communication by RRT members, perceived busyness of RRT members, and believing bedside nurses should handle the concerning patient situation (Astroth et al., 2013; Williams, Newman, Jones, & Woodard, 2011). Although most nurses agreed that they should call the RRT if unable to reach the physician (Bagshaw et al., 2010; Jackson et al., 2016; Shapiro et al., 2010), some believed that the physician should be called first before activation of the RRT (Astroth et al., 2010; Bagshaw et al., 2010; Braaten, 2015; Chua et al., 2017; Jackson et al., 2016). Another barrier to RRT activation is nursing staff attempting to seek input or assistance from other staff members, thus delaying or not activating the RRT when it is appropriate (Braaten, 2015; Massey, Chaboyer, & Aiken, 2014; Wynn, Engelke, & Swanson, 2009). Finally, an additional barrier identified is nurses' unfamiliarity with criteria to activate an RRT (Davies et al., 2014; Kitto et al., 2015; Massey et al., 2014; Shapiro et al., 2010).

Strengths

When considering strengths in the literature, there are several areas of agreement in the barriers and facilitators of activating an RRT. Facilitators to activate the RRT include beliefs that RRTs are skillful in managing critically ill patients, are supportive and provide immediate assistance, and provide mentoring and emotional support to staff (Astroth et al., 2013; Jenkins et al., 2015; Shapiro et al., 2010; Williams et al., 2011). Additionally, the studies indicate that the culture or social milieu within nursing units generally supports activating RRTs, expressing

positive outcomes from calling (Astroth et al., 2013; Braaten, 2015; Jenkins et al., 2015). Nurses also believe that RRTs can prevent cardiopulmonary arrest and prevent minor issues from becoming major problems (Bagshaw et al., 2010; Jackson et al., 2016; Jenkins et al., 2015). Additionally, nurses believe that calling the RRT does not increase workload; instead, it enhances skills in caring for critically ill patients (Bagshaw et al., 2010; Jackson et al., 2016; Jenkins et al., 2015; Williams et al., 2011). Another facilitator or prompt to activating the RRT is a clinical change in a patient, especially when the transformation is sudden and specifically if it is a change in mental status (Braaten, 2015; Davies et al., 2014; Leach, Mayo, & O'Rourke, 2010; Massey et al., 2014; Shapiro et al., 2010). Being familiar and agreeing with RRT protocol is identified as a factor facilitating the activation of an RRT (Davies et al., 2014; Leach et al., 2010). Finally, nurses overwhelmingly do not believe that RRTs exist because management by nurses or physicians is inadequate (Bagshaw et al., 2010; Jackson et al., 2016; Jenkins et al., 2015).

Weaknesses

Despite the strengths in the literature, there are weaknesses or uncertainties, the first being whether fear of criticism or appearing "dumb" influences the decision to activate an RRT. While many studies report this as a barrier, others adamantly refute the existence of this concern, which may be due to variances in culture among the organizations studied (Astroth et al., 2013; Bagshaw et al., 2010; Braaten, 2015; Chua et al., 2017; Jackson, Penprase, & Grobbel, 2016; Kitto et al., 2015; Massey et al., 2014; Shapiro et al., 2010; Williams et al, 2011). There is also an inconsistency as to whether an RRT would be activated if a nurse was concerned about a patient who exhibited normal vital signs (VS) (Bagshaw et al., 2010; Jackson et al., 2016).

Gaps in the Literature

Gaps in the literature include the fact that the nurses studied were primarily from medical-surgical units, with only two studies surveying nurses from other units (Jackson et al., 2016; Shapiro et al., 2010). It is unknown if findings on RRT activation from medical-surgical nurses apply to nurses working in other areas, such as procedural areas, postpartum, and psychiatric units. One study primarily included physicians who made up 81% of the respondents (Davies et al., 2014). Most studies were also conducted in single institutions, limiting generalizability. There is also considerable variability in the RRT education that staff received in each institution studied. One institution reported that all staff received preliminary education (Davies et al., 2014); however, the others do not disclose this information or only discuss ongoing education to staff (Jenkins et al., 2015). Finally, another limitation in the literature is a lack of documented or varying levels of nurse experience. This inadequacy calls into question whether the level of experience influences nurses' decision making to activate an RRT.

METHODS

The purpose of this DNP project was to investigate nurses' decision making in calling a rapid response, utilizing frameworks for analyzing and evaluating the system and for analyzing the thought processes of nurses.

Design

This project utilized a descriptive design to investigate nurses' decision making in activating the RRT (Moran, 2017b). This method was helpful in that it facilitated nurses to share their experiences in activating the RRT, whereas an observational design would require capturing decision making at the moment and be logistically challenging to accomplish. Results

from this project can be used to guide future improvement in the area of RRTs (Rouen, 2017). A convenience sample of registered nurses was interviewed after obtaining Institutional Review Board approval, ensuring assessment of the risks of the project and appropriate protection of the organization and individuals involved (Moran, 2017a).

Setting

The setting was a Medical-Surgical unit in a 288-bed regional medical center in the Northwest region of the United States (Appendix C & D). The hospital has an established RRT, consisting of an ICU RN, RT, and nursing supervisor. The additional staff that may be involved in the rapid response include the bedside nurse and primary provider. The principal leader of the RRT is an ICU RN, which is designated by the ICU charge RN. The role of the team is to assess the patient, identify possible interventions, and discuss the patient situation with his/her primary physician along with the bedside nurse. If the primary physician is not available, the hospitalist service is contacted for further assistance.

Participants

Participants were recruited from within the unit and across all shifts through email and poster announcements; the goal was 15 RNs. Equal representation was encouraged by including nurses with various experience levels, lengths of employment on the unit, ages, and genders. Also, all nurses, whether they had activated the RRT or not, were included due to the reported low number of RRT activations in the facility and to fully understand the factors influencing activation. Participants needed to be able to provide insight into the dynamics of the unit. Therefore, inclusion criteria comprised nurses who had worked within the facility for at least one month and being employed primarily on the unit (as opposed to “floating” or having been

temporarily assigned from another unit). Exclusion criteria included having worked in the facility for less than one month and "floating" or being "temporarily assigned" to the unit.

Instrument

A semi-structured interview tool composed of questions derived from cognitive work analysis and Benner's theory of skill acquisition was developed to accomplish this project (Braaten, 2015; Jenkins et al., 2009; Naikar, 2013; Snowden et al., 2014). The interview began with demographic questions (Questions 1 & 2) (Appendix A). Five questions (3-7) were used to inquire participants on their years of total nursing experience, education, role, and time worked in the facility and unit. Question 8 asked the nurse to quantify how many times they have activated the RRT in the last two years. This question was developed to provide insight into the relationship between frequency and the decision making process if any. Those who activated the RRT were then asked questions 9-12, further describing their experience activating the RRT, while the remainder of the participants were skipped to question 13. Question 9 invited participants to recall their most recent experience activating the RRT, beginning the open-ended questions of the interview. Question 10 asked the nurse to discuss the cue prompting them to call the RRT, assessing the ***worker competency*** constraint. This question also assessed a nurses' competency in terms of Benner's theory of skill acquisition and whether intuition affected activating the RRT. Question 11 focused on the ***tasks*** constraint, exploring what nurses accomplish for RRT activation. Question 12 encompassed both the ***tasks*** and ***strategies*** constraints, assessing what a nurse accomplishes before RRT activation and what strategies support or hinder the activation of the RRT. Questions 13, 18, and 19 focused on the ***resources*** supporting the activation of the RRT, including both human and non-human resources. Question

14 assessed the ***strategies*** constraint or alternatives to calling the RRT. Question 15 assessed the ***social system*** constraint and how the social norms in the unit affected activating the RRT. In questions 16 and 17, the nurse was asked to describe the benefits and challenges of calling a rapid response, as well as how it influenced their work; these questions were designed to solicit any additional information regarding the nurse's decision making that may not have been discussed.

Data Collection

As noted previously, nurses were encouraged to participate through a variety of means. Nurses were first informed on the focus of the interview and purpose of the project. The participants were ensured on the steps taken to protect their confidentiality, apprised that participation was voluntary, asked permission to record the interview, and consent was obtained for participation (Appendix B). These interviews took place in a private setting off the unit to minimize interruptions and anticipated to last approximately 15-30 minutes. Participants were also allowed to leave the discussion at any time. The recordings of the conversation were transcribed and further analyzed by this author, the principal investigator (PI).

Data Analysis

Quantitative data, including demographic data and questions 3-7 were entered into SPSS statistical software and analyzed using descriptive statistics. Narrative obtained from open-ended questions in the interview were reviewed utilizing content analysis, primarily by reading the interview transcripts repeatedly to form an overall impression of the data. Data was then categorized into themes and patterns using the framework of cognitive work analysis to classify the multiple dimensions of this project (Braaten, 2015).

Ethical Considerations

When considering research as it relates to human subjects, it is crucial to contemplate the concepts of respect for persons, beneficence, and justice. These concepts were examined as they relate to this study to ensure that participants were treated ethically and safely.

Respect for Persons

In terms of respect for persons, each participant gave consent (Appendix B) before participating in the interview. Participants were assured that participation was completely voluntary and the identity of participants would remain confidential. For the sake of privacy, the discussions took place off the unit to allow participants to speak freely.

Beneficence

One objective of this project was to generate knowledge that would improve future rapid response team processes, ultimately leading to better outcomes for both patients and nurses. This objective is in line with the concept of beneficence because ultimately the welfare of the participants, nurses, was at the center of the project. There was some risk in that participants could potentially be hesitant to provide negative information or discuss situations in which they performed poorly. However, it was also deemed beneficial to give the nurses a venue to discuss their experiences with activating the RRT, as they may have never had the opportunity to do so.

Justice

Recruitment for this project directly targeted one of the populations that will ultimately benefit from this project, bedside nurses. At the same time, recruitment did not unfairly target a particular segment of nurses, as a variety of means was used to recruit nurses and the interviews took place at different times to accommodate nurses working on all shifts. Inclusion and

exclusion criteria were fair in that there were minimal limitations, participants only needed to work on the unit involved in the project and have worked there for a month to ensure they had some understanding of the workplace and RRT activation.

RESULTS

Sample Characteristics

Ten nurses from a Medical-Surgical Oncology unit participated in semi-structured interviews utilizing the tool developed from cognitive work analysis and Benner's theory of skill acquisition (Braaten, 2015; Jenkins et al., 2009; Naikar, 2013; Snowden et al., 2014). Three nurses from the unit declined to participate, and two nurses failed to meet inclusion criteria because they were "floating" to the unit. Of the 10 nurses sampled, the mean age of nurses was 38.3 (*SD* = 11.126), ranging from 28 to 64 years old. All of the participating nurses were female. When considering the level of nursing education, 10% of participants were diploma nurses, 40% ADN nurses, and the remaining 50% of nurses possessed a BSN.

There was equal representation of the participating nurses working the dayshift (50%) and the night shift (50%). When analyzing experience according to Benner's theory of skill acquisition, nurses ranged in experience level from advanced beginner to expert (Snowden et al., 2014). Advanced beginners are those with significant situational experience, less than 2-3 years of experience in the environment, and who can identify significant aspects but still require some assistance with prioritization (Snowden et al., 2014). As previously noted, expert nurses are those with sufficient experience to have an intuitive perspective, deep understanding of situations, do not rely on guidelines, and demonstrate experiential knowledge (Snowden et al.,

2014). Among the ten nurses in the sample, 10% were considered advanced beginner, 20% competent, 20% proficient, and 50% expert.

The mean years of RN experience were 12.04 (*SD* = 13.2), ranging from one year and three months to 43 years and 10 months. Length of employment on the unit ranged from eight months to 11 years and 10 months (Table 2).

TABLE 2. *Nurses' length of employment on the unit in years*

Years	
Mean	4.32
Median	2.50
Range	11.16
Minimum	0.67
Maximum	11.83

Additionally, nurses reported a length of employment in the facility, also ranging from eight months to 11 years and 10 months (Table 3).

TABLE 3. *Nurses' length of employment in the facility in years*

Years	
Mean	4.53
Median	2.50
Range	11.16
Minimum	.67
Maximum	11.83

Among the nurses who participated, 30% reported they were charge nurses, also known in the facility as shift unit supervisors, and the remaining 70% said they were staff nurses. When considering the approximate amount of times they activated an RRT in the previous two years, one nurse reported never activating an RRT. The maximum number of reported RRT activations during the previous two years was 10, with a mean of 2.9 (Table 4).

TABLE 4. *Approximate amount of RRT activations within the last two years.*

Years	
Mean	2.90
Median	2.00
Mode	2.00
Range	10.00
Minimum	.00
Maximum	10.00

Nurses were then asked to describe their most recent experience activating the RRT to start the interview, and then this event was further dissected in the following questions. Nurses' responses regarding decision making for activating the RRT, organized by the five domains of cognitive work analysis, is outlined below (Braaten, 2015; Naikar, 2013).

Resources

The first question in regards to resources asked nurses "What resource (work environment support) factors affect whether or not you call a rapid response? Are there resources that vary from day to day?" A variety of responses were received, with two nurses reporting that they did not believe any resource factors influenced their decision to activate the RRT, with one nurse stating, *"no, if I need a rapid response I call one."* Provider involvement was identified as a factor by three nurses in the unit, and one expert nurse stated, *"if the physician is right there, then they can help assess."* It was also identified by a proficient nurse from night shift that "*overnight we have obviously less resources than day shift does...day shift has their doctors here...usually there's a nurse practitioner floating around*." Two nurses, both from the night shift, one an advanced beginner and one competent, identified that individual providers often influenced whether an RRT was activated. These nurses stated some physicians are, "*not very*

proactive" and "*some of our providers are very receptive to being called, some of them are not.*" The hospital call system was also identified as a factor influencing RRT activation, as one nurse stated, *"Our call system...what physician is on call is kind of hard to figure out, and even if you call the operator and ask them who is on call sometimes they give you the wrong physician."*

Four nurses reported that *"the other staff on the unit,"* particularly charge nurses, often influence RRT activation. These responses varied, however, with one nurse stating "*we have a very good team here as far as resources like our charge nurses, they are there right away and they would help you make that decision."* Another nurse reported that some charge nurses are not as experienced, stating that *"there might be some...lack of knowledge in what to do when you're looking for resources in your charge nurse."* Two nurses also reported that having other experienced nurses in the unit influenced whether or not they called, one stating, "*if there was somebody that...didn't have like an experienced nurse to come in...and look at the patient...that would be a reason why I'd call."* Two nurses reported that respiratory therapists influenced whether or not they called, stating *"respiratory is a big support here,"* and *"If you've got respiratory on the floor, sometimes they can come in, and kind of help spot check things before you call a rapid response."*

The next question concerning resources asked "Have you received any education regarding when to call a rapid response? Was this education conducted in nursing school, on the unit or in a more formal setting?" Three nurses, all expert-level, reported that they had not received any education regarding when to activate the RRT. One of these nurses stated, *"No, just kind of you know your clinical signs and your gut."* Five nurses of different levels of experience reported being educated on RRT activation at some point during their employment either in

orientation, “code blue” drills, or by email. Two nurses reported learning about RRT activation in nursing school. Three nurses also said that they had received education on RRT activation at previous places of employment.

Tasks

The first question regarding tasks asked nurses “What (problem-solving or decision-making) actions do you perform before calling the rapid response?” Eight nurses reported performing some form of assessment followed by a variety of interventions based on the situation, and one nurse reported immediately calling after an assessment. These interventions included obtaining vital signs, applying oxygen, repositioning or transferring to the bed, inserting an intravenous (IV) line, starting IV fluids, obtaining blood glucose, administering Narcan, and discussing the patient situation with family or other staff members. Nurses reported that these events often coincided with activating the RRT, one nurse stating, *“I think they kind of all took place at once because my team comes.”* The acuity of the situation also influenced the tasks that nurses performed, and one nurse stated, *“we pretty much called right away.”* Another nurse described a situation in which a patient *“was having agonal breathing...he looked just awful”* and noted that *“in that instance, it wasn’t appropriate to do a lot”* before activating the RRT.

A second question regarding the task domain asked “Are there situations in which you would wait to call a rapid response? Why?” Three nurses noted that they might wait to call to get a more accurate assessment on the patient and *“take a look at why this patient is doing what they’re doing.”* Another nurse stated there have been situations where *“you don’t call them right away, you’re still assessing”* Two nurses, one advanced beginner and one competent, reported that they would often try to call the physician first if they believed the situation allowed it, one

nurse citing that physicians, *"get kind of upset, and so we get in trouble."* Four nurses stated they might wait to call depending on the acuity of the situation, and one expert nurse stated, *"when it's a drastic change in a patient, and then the concern is there...that's when you call a rapid response."*

Strategies

The first question concerning strategies is the previous question, "Are there situations in which you would wait to call a rapid response? Why?" Five nurses reported that they might wait to call a rapid response if the patient appeared "stable" and if it was a known issue they thought could be easily resolved. One of these nurses, identified as proficient, stated: *"If I had enough means that I felt like the patient was still stable...if I thought that we were managing their care here then I would keep them here."* Another one of these nurses, identified as competent, described a situation in which a patient had been experiencing orthostatic hypotension, and not calling the RRT "because we were confident that the patient would respond appropriately to what we were doing, and they did."

The next question regarding strategies asked, "Are there any other options or alternatives to calling a rapid response?" Four nurses noted that discussing the patient situation with the physician and attempting to obtain orders was an option. An additional four nurses cited calling a code blue as another option, with one nurse noting, *"there's a lot of gray area of which to call a rapid response or a code blue."* It was however brought up by three nurses that they had received an email recently from hospital leadership with clarified when to call a rapid response versus a code blue, one nurse stating it, *"kind of cleared up a lot of that."* Consulting other staff members including other nurses and respiratory therapists was an option cited by five nurses, one

advanced beginner nurse stating *"I would consult my coworkers, those experienced on the floor."*

Social System

In regards to the social system, nurses were asked: "How would you describe the work culture or social norms around activating rapid responses in your unit?" Six nurses expressed positive views, noting that they believed rapid responses were initiated when needed. One proficient-level nurse from night shift stated, *"I think we're pretty good about calling when we need to."* Another of these nurses, considered competent and from the day shift stated, *"I don't think there's any hesitations or anything like that."* An additional proficient nurse from day shift stated, *"I would say our comfort level is pretty good because we know that if we need a rapid response...they're going to know we truly need help."* One expert nurse from day shift also stated, *"I'm confident they'll be right there, they're polite, they're courteous, and they respect me as the RN that's taking care of the patient."* One proficient nurse from day shift also stated, *"I think before, and this was kind of prior to me being here, there was discussion that if you called and it was inappropriate the people that responded would kind of be upset that they kind of wasted their time. But I feel like this hospital has worked hard at putting out the message that when in doubt just call."*

Three nurses expressed negative views of the culture in the unit, all of whom were from night shift. One competent nurse stated, *"they're terrible, there's a lot of I guess fear of repercussion right now."* Another nurse, considered advanced beginner, stated, *"I think there's a fear...of like calling when you didn't need to call, and I don't know where that culture stems from, but it's been present since I started."* Three nurses also discussed a concern that they

occasionally had situations in which they felt patients' acuity was too high for the unit and providers did not always hear their concerns. These concerns have prompted activation of the RRT, and one proficient nurse stated, *"I've been trying to kind of nip that in the bud...we have a 1:4 ratio and we can't take care of patients that are that sick."* In addition to these views, one expert nurse working on night shift noted that RRT activation might be too frequent in the unit, stating, *"I don't think they're discouraged, I think they might be a little quick to do so sometimes."*

Worker Competency

When assessing the worker competency constraint, nurses were asked: "What patient factors or what in your assessment of the patient prompted you to call the rapid response?" The most common cue, described by seven nurses, was a change in mentation. Low oxygen saturation, pallor, tachycardia, and hypotension reportedly often accompanied this alteration in consciousness. In addition, a nurse identified as proficient described a patient with *"agonal breathing...unable to protect his airway"* as the reason for RRT activation. Finally, another nurse, identified as competent, described a patient situation in which a patient was, *"very combative"* and with *"pain we could not control with anything"* as the primary reason to call the RRT.

Additional Factors

To further evaluate the factors influencing their decision making nurses were asked: "What are the benefits and challenges of calling a rapid response? Do you see RRTs as beneficial for your patients? How do RRTs affect your patient care?" Participating nurses provided a variety of responses. All of the nurses interviewed stated that they believed RRTs were

beneficial for their patients. The opportunity to *"have those extra set of eyes"* accompanied by *"expertise at the bedside"* was a benefit described by seven of the nurses. The next most common benefit, described by four nurses, was receiving immediate help via the ability of the RRT to intervene quickly. As one of these nurses said, *"it gets things rolling in a certain direction maybe more quickly than they might otherwise."* Three nurses also described preventing a code blue from occurring as a benefit. One proficient nurse said, *"it's helpful to be able to call that [RRT] before you call a full code."* One expert nurse also cited *"better patient outcomes"* as a benefit of RRTs, but did not mention specific examples. In terms of challenges or negative aspects, five nurses stated they did not feel there were any. Two nurses discussed overcrowding and people *"just standing out of the room"* but also stated, *"you kind of...have to direct traffic...but I don't see that as a negative."* Two nurses described the challenges of staff dynamics and questioning by the RRT. One proficient nurse stated, *"it's all dependent on what providers and what nurses and what resources are on"* and *"if you don't have someone [nurse] that's assessment skills are spot on"* there is *"questioning."* Two nurses described knowing when to call as being a challenge, one proficient nurse recalling, *"knowing when to call because nobody wants to call when they [RRT] come down, and they're [patient] fine."* Finally, one nurse also described a potential challenge of RRT activation becoming a *"crutch,"* compromising nurses' skills and practice. This nurse also stated the prevention is in continuing *"to educate and make our staff feel empowered that they can do certain things at the bedside."*

The next question asked nurses, "Does the existence of a rapid response team influence your work? How so? Seven nurses said it did not influence their work, but six of them stated that the existence of the RRT was a *"comfort," "security," "layer of support"* and *"it's nice to know*

it's there." One nurse, identified as proficient stated, *"I think that they help our work; I mean I don't know what I would do without them some of these days."* Another nurse, also proficient, stated, *"it's just nice to have that resource...if you feel like there's something wrong with your patient."* An expert nurse stated, *"being able to call that [RRT] and know that you're gonna have more people show up within a couple of minutes and have more eyes on this patient...there's a comfort in knowing that."*

Lastly, nurses were also asked, "Are you aware of any hospital policy on RRT activation? Do you know the criteria for such activation?" These nurses were provided with the hospital policy "Clinical Assessment Team, AGN315" and then asked: "What is your perspective on these criteria?" Nurses' responses to these questions varied and six nurses were unaware of a policy or unsure if one existed. Further responses from these nurses included, *"I'm not aware of it [the policy], but there probably is one"* and *"not necessarily…just press the button and yell for help."* Four nurses expressed that they knew a policy existed, but were unsure of the content, as one proficient nurse stated, *"I don't know that I've ever read it."* Two nurses, one competent and one expert, expressed the difficulty locating policies in the facility, one stating, *"our policies used to be slightly convoluted...now...it's a lot quicker [to locate]".* After being provided with the policy, responses from all nurses were positive on having a policy, as two nurses said *"you should give us a copy"* and *"I think that [the policy] looks good."*

DISCUSSION

As previously noted, RRTs are only effectual if there is recognition of patient need and activation of the RRT (Jackson, 2017). The underlying concern when considering RRT activation is "failure to rescue" or failure to activate RRT activation (AHRQ, 2017). The purpose

of this project was to investigate nurses' decision making processes in calling a rapid response, thereby increasing understanding and thus promoting better patient outcomes. The results from this project portray the factors and elements involved in the decision-making process to activate the RRT by nurses working on a Medical-Surgical Oncology unit. Additionally, nurses were empowered to continue RRT activation by gaining awareness of the hospital's policy on RRT activation.

Resources

A variety of resources were reported to influence RRT activation. Among these, provider involvement plays a significant role. This finding was consistent with previous work reporting that nurses stated providers should be called first before activation of the RRT (Astroth et al., 2010; Bagshaw et al., 2010; Braaten, 2015; Chua et al., 2017; Jackson et al., 2016). Nurses also reported that individual providers and their responses influenced RRT activation. The project hospital's policy specifies that "the deteriorating adult patient" warrants RRT activation, and "the primary physician will be notified immediately after assessment is completed." Such policy calls in to question the appropriateness of calling providers first, which could serve as a barrier to prompt RRT activation.

Other resources affecting RRT activation included the hospital call system, which was not a factor identified in the literature. The nurses on the unit were also generally positive about other staff on the unit, specifically charge nurses and respiratory therapists, as significant resources. This finding is consistent with the literature (Braaten, 2015; Massey, Chaboyer, & Aiken, 2014; Wynn, Engelke, & Swanson, 2009). It is notable that nurses report positive

working relationships with their coworkers; however, this too may be a barrier to timely RRT activation if nurses are seeking out advice before activation.

Regarding education around RRT activation, it was interesting to note that nurses' responses were considerably varied. Such significant variability in reported education is consistent with existing literature (Davies et al., 2014; Jenkins et al., 2015). In the present project, only expert nurses reported never receiving any training, which may be due to education that took place in the remote past. Of the nurses who recounted education, there was not a consistent form of guidance in the facility. It is troublesome that half of the nurses described not receiving any information about RRT activation from hospital administration. The current literature has reported that awareness of RRT activation criteria facilitates RRT activation, building the case for future work is in this area (Davies et al., 2014; Leach et al., 2010).

Tasks

When evaluating the task constraint, findings from the present project were consistent with Braaten's (2015) study that described the task of justification before RRT activation. This task involves the need to justify activating the RRT before calling (Braaten, 2015) All but one of the nurses who had activated an RRT described a notable change in their assessment of the patient. These nurses then reported performing a variety of interventions, none of which are perceived as inappropriate for their particular situations. These interventions often coincided with RRT activation and may be classified as strategies rather than the task of justification. Nurses also reported calling providers before RRT activation, which as may serve as a barrier to timely and appropriate RRT activation. The acuity of a patient's condition also dictated the timing of RRT activation, with drastic changes warranting immediate calls. Similar to the finding

of this project, sudden changes promoting RRT activation is consistent with the literature (Braaten, 2015; Davies et al., 2014; Leach, Mayo, & O'Rourke, 2010; Massey et al., 2014; Shapiro et al., 2010).

Strategies

Concerning the strategies constraint, nurses reporting delayed calls if the patient was stable and they thought they could resolve the issue is consistent with findings in the literature (Astroth et al., 2013; Williams, Newman, Jones, & Woodard, 2011). According to the hospital policy, if a patient is indeed stable, then an RRT is not necessarily warranted. The caveat to this is that the boundaries between stable and unstable patient conditions are often unclear. Attempting to resolve the patient issue may serve as a strategy and further delay RRT activation (Braaten, 2015). Nurses also reported calling a code blue as an alternative to RRT activation. There is ongoing education in the project hospital regarding code blue versus RRT activation, which is positively viewed by nurses and is encouraging as literature shows that awareness of RRT protocols facilitates appropriate RRT activation (Davies et al., 2014; Leach et al., 2010). Consulting other staff members and providers was another strategy identified by the participating nurses, which again may delay RRT activation (Braaten, 2015; Massey, Chaboyer, & Aiken, 2014; Wynn, Engelke, & Swanson, 2009).

Social System

In regards to the social system constraint, responses from nurses were mixed. Most nurses spoke positively in regards to the unit culture, stating the RRT is activated appropriately and is very useful to nurses. This finding is consistent with the existing literature (Astroth et al., 2013; Braaten, 2015; Jenkins et al., 2015). It was acknowledged by one day shift nurse that there

were negative perceptions of RRT activations in the past, but this is no longer the perception in the current state. Interestingly, negative views on the unit culture surrounding RRT activation only came from night shift nurses of varying skill levels, who cited fear of calling and feeling that they are being tasked with the care of patients “too sick” for the unit. Most nurses expressed that they were actively involved in changing the unit culture to eliminate these negative views. It was interesting that one nurse conveyed that the RRT was overutilized, which would be difficult to determine as data on the appropriateness of RRT calls is unavailable and would be difficult to obtain. However, this is not in agreement with the other nurses’ views in the unit or with what hospital leadership described prior to this project.

Worker Competency

When assessing worker competency, it was clear that abrupt clinical changes support immediate RRT activation, consistent with the literature (Braaten, 2015; Davies et al., 2014; Leach, Mayo, & O’Rourke, 2010; Massey et al., 2014; Shapiro et al., 2010). Only one competent-level nurse recounted an RRT activation in a patient who did not have an abrupt change, but rather subtle changes over time. This finding is intriguing, as recognition of subtle clinical changes is associated with a higher level of competency, as opposed to recognizing abrupt clinical changes (Braaten, 2015). In situations with abrupt changes, it is unknown whether subtle signs preceded the drastic alteration; however, this was not the focus of this project. It is pertinent to note that RRTs are not intended to be for "extreme situations" or a replacement for code blue response but to intervene before a patient's demise (Braaten, 2015). It is troublesome that the results from this project imply that most nurses are only calling the RRT under these “extreme situations” (Braaten, 2015).

Additional Factors

All nurses reported they believed RRTs were beneficial, regardless of how often and if they utilized them. They pointedly recounted the benefits of receiving expertise assistance, intervening quickly, preventing cardiopulmonary arrest, and potentially achieving better patient outcomes, which were all noted in the literature (Astroth et al., 2013; Bagshaw et al., 2010; Jackson et al., 2016; Jenkins et al., 2015; Shapiro et al., 2010; Williams et al., 2011). Nurses also expressed satisfaction in the existence of the RRT to support their work. Negative aspects of RRT activation, including overcrowding, did not necessarily influence its activation. Staff dynamics and communication were also challenging factors.

Additionally, the uncertainty of knowing when to call and lack of knowledge concerning RRT activation criteria were noted to be dominant barriers to activation. Nurses expressed positive views on learning RRT activation criteria and some recounted feeling justified in their past RRT activations. It has been reported that awareness of RRT protocols facilitates RRT activation (Davies et al., 2014; Leach et al., 2010), which was the intent of disclosing these criteria to the nurses participating

Strengths and Limitations

This project had several strengths, the first of which was the participation of nurses. Of the fifteen nurses available for interviews, only three declined to participate, and two nurses did not meet criteria. Staff nurses from both shifts as well those in supervisory roles participated in this project. Nurses with varying experience, education, and length of employment also participated in the project. Among all nurses, there was an agreement that RRTs were beneficial

to their patients. Nurses also expressed positive views of the hospital's policy on RRT activation and stated they would incorporate this knowledge into practice.

Unfortunately, this project also exhibited several limitations, the first of which involves the convenience sample. Because of the design, it is plausible that the sample is not representative of the unit staff. Furthermore, none of the participants were male due to declining to participate, making it unknown if male nurses have differing perspectives on RRT activation. The small sample size coupled with the varying experience levels of the participants made it difficult to determine if experience level influenced RRT activation. Interviews took place on two separate occasions per the unit's availability, and it is unclear if additional times would have increased participation and potentially influence the results. Finally, this project was dependent on nurses' recall, and may not fully represent the decision making of nurses at the time of RRT activation.

Implications to Future Practice

The results of this study have several implications for future practice. The most significant implication is the need for further education regarding RRT activation, not only within this unit but within this hospital and other hospitals. It was also noted by hospital leadership that this unit exhibits more RRT activations than other units, which warrants education in other units as well. Training should also include barriers to RRT activation so that staff can be cognizant of these in their practice. Barriers identified by nurses in this project included provider notification, the hospital call system, obtaining assistance from other staff, attempting to resolve the issue first, and failing to recognize subtle changes. In-services may be the best venue for this education, and they would enable a consistent message proclaimed to all

staff. In addition to education, provider communication was also deemed problematic by nurses. Nurse practitioners can play a unique role in these situations, serving not only as nurse educators but also bridging gaps in communication between members of the healthcare team.

CONCLUSION

This project was formed on the basis that RRTs are effective in promoting better patient outcomes, but that for this to occur RRTs must be activated appropriately. This project identified a variety of factors and elements involved in nurses' decisions to activate the RRT. Within these factors, a variety of resources influenced this decision, which includes education and dynamics with other members of the healthcare team. The primary task associated with justifying an RRT activation was patient assessment, sometimes accompanied by various interventions. Nurses also described strategies they use when confronted with a concerning patient situation, including seeking out assistance from other members of the team and activating a "code blue." The social system was also identified as a factor including RRT activation, although there were varying opinions on the current state of unit culture. Nurses also described cues leading them to RRT activation, which is most commonly an abrupt change in patient condition. The nurses interviewed described RRTs as highly beneficial for their patients and expressed appreciation for members of the team, despite some identified challenges or negative aspects of RRT activation. Most nurses interviewed were unfamiliar with the hospital policy, indicating that further education is warranted not only for nurses but all members of the healthcare team in regards to RRT activation. Continued work is needed to increase understanding, leading to timely RRT activations and better patient outcomes.

APPENDIX A:

INTERVIEW GUIDE

INTERVIEW GUIDE

1. Age __

2. Gender
   Male Female

3. RN experience ____ years __ months

4. Level of nursing education
   Diploma ADN BSN Masters or higher

5. Time worked on this unit __years ___ months

6. Time worked in this facility ___years ____ months

7. Role
   Staff RN Charge RN

8. Approximately how many times within the last two years have you called a rapid response? ___

(For those who have called an RRT continue on, for those who have not called an RRT skip to question 13).

9. Can you describe the most recent experience you had calling a rapid response?

10. What patient factors or what in your assessment of the patient prompted you to call the rapid response? *(Worker competency)*

11. What (problem-solving or decision-making) actions do you perform before calling the rapid response? *(Tasks)*

12. Are there situations in which you would wait to call a rapid response? Why? *(Tasks/Strategies)*

13. What resource (work environment support) factors affect whether or not you call a rapid response? Are there resources that vary from day to day? *(Resources)*

14. Are there any other options or alternatives to calling a rapid response? *(Strategies)*

15. How would you describe the work culture or social norms around activating rapid responses in your unit? *(Social system)*

16. What are the benefits and challenges of calling a rapid response? Do you see RRTs as beneficial for your patients? How do RRTs affect your patient care?

17. Does the existence of a rapid response team influence your work? How so?

18. Have you received any education regarding when to call a rapid response? Was this education conducted in nursing school, on the unit or in a more formal setting? *(Resources)*

19. Are you aware of any hospital policy on RRT activation? Do you know the criteria for such activation? *(provide RRT activation criteria).* What is your perspective on these criteria?

APPENDIX B:

CONSENT TO PARTICIPATE IN RESEARCH

University of Arizona
Consent to Participate in Research

Study Title: Investigating Nurses' Decision Making in Activating the Rapid Response Team

Principal Investigator: Hannah Christensen

You are being asked to participate in a research study. Your participation in this research study is voluntary and you do not have to participate. This document contains important information about this study and what to expect if you decide to participate. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

The purpose of this project is to investigate nurses' decision making processes in calling a Rapid Response, with the ultimate goal of increasing understanding and promoting better patient outcomes. In doing so, one objective is to collect data from nurses on their experiences activating the RRT. A second objective is to analyze the information and data gleaned from these nurses and identify themes and patterns in nurses' decision making. Finally, the knowledge gained from this project will be disseminated to those involved in the care of patient populations affected by the RRT.

This will involve an approximately 15-30 minute semi-structured interview, in which you can share your experiences and thoughts activating the RRT.

There are no expected risks to you as a result of participating in this study. You may choose to discontinue the interview at any time. Your name will not be included in any report.

You will not benefit directly from participating in this study.

With your permission, I would like to audiotape this interview so that I can make an accurate transcript. Once I have made the transcript, I will erase the recordings. Your name will not be in the transcript or my notes.

The information that you give in the study will be anonymous. Your name will not be collected or linked to your answers.

Because of the nature of the data, it may be possible to deduce your identity; however, there will be no attempt to do so and your data will be reported in a way that will not identify you. Information collected about you will not be used or shared for future research studies.

The information that you provide in the study will be handled confidentially. However, there may be circumstances where this information must be released or shared as required by law. The University of Arizona Institutional Review Board may review the research records for monitoring purposes.

For questions, concerns, or complaints about the study you may contact **Hannah Christensen at hjarrett@email.arizona.edu or (360) 731-5793.**

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact (1) the Human Subjects Protection Program at 520-626-6721 or online at http://rgw.arizona.edu/compliance/human-subjects-protection-program, or (2) the KRMC Institutional Review Board at 406-758-7495 or at irb@krmc.org.

Signing the consent form

I have read (or someone has read to me) this form, and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject	Signature of subject	Date

APPENDIX C:

THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL LETTER

THE UNIVERSITY OF ARIZONA
Research, Discovery & Innovation

Human Subjects Protection Program

1618 E. Helen St.
P.O. Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
http://rgw.arizona.edu/compliance/home

Date:	April 01, 2019
Principal Investigator:	Hannah Marie Christensen
Protocol Number:	1903470992
Protocol Title:	INVESTIGATING NURSES' DECISION MAKING IN ACTIVATING THE RAPID RESPONSE TEAM
Level of Review:	Administrative Review
Determination:	Approved
IRB of Record:	Kalispell Regional Medical Center
Investigator at Site:	Hannah Christensen
IRB of Record Protocol Number:	2019-001-GVRI-Other

Documents Reviewed Concurrently:

Data Collection Tools: *Interview Questionaire.pdf*
HSPP Forms/Correspondence: *Advisor Confirmation Email.pdf*
HSPP Forms/Correspondence: *Christensen_DNP_IRB_032519.pdf*
HSPP Forms/Correspondence: *Christensen list_of_research_personnel.pdf*
HSPP Forms/Correspondence: *Confirmation for Scientific Review and Department Review.pdf*
Informed Consent/PHI Forms: *2019 02 07 Informed Consent.doc*
Other Approvals and Authorizations: *COI Certification Complete for 1903470992.msg*
Other Approvals and Authorizations: *IA Executed.pdf*
Other Approvals and Authorizations: *Initial Submission Approval Letter.pdf*
Recruitment Material: *Christensen_DNP Project Flyer_02 11.docx*

Regulatory Determinations/Comments:

- Kalispell Regional Medical Center: When an institution is designated IRB of record, the UA IRB will not review the project. The University of Arizona agrees that it will rely on the review, approval, and continuing oversight of the institution's IRB pursuant to the terms of the Institutional Review Board Authorization Agreement.

- The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).
- All documents referenced in this submission have been reviewed and are filed with the HSPP.
  The Principal Investigator should notify the IRB immediately of any proposed changes that affect the LOCAL protocol and report any LOCAL unanticipated problems involving risks to participants or others. Please refer to Guidance's *Investigators Responsibility after IRB Approval* and *Reporting Local Information*.
- All research procedures should be conducted according to the approved protocol and the policies and guidance of the IRB of record.

APPENDIX D:

KALISPELL REGIONAL MEDICAL CENTER INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL LETTER

Kalispell Regional Medical Center
KALISPELL REGIONAL HEALTHCARE

Institutional Review Board
310 Sunnyview Lane | Kalispell, MT 59901 | (406) 758-7495
FWA00010549 | IRB00004635

February 8th, 2019

Hannah Christensen
310 Sunnyview Lane
Kalispell, MT 59901

Study Title: *Investigating RRT Activiation*

IRB Protocol Number: 2019-001-GVRI-Other

RE: New Study Submission Approval

Dear Ms. Christensen,

This letter is to officially notify you that after an expedited review the Kalispell Regional Medical Center (KRMC) Institutional Review Board (IRB) have determined that this study meets criteria IAW 45 CFR 46.110 of minimal risk to participants and has given its approval for the above referenced study. The expiration date for this approval is February 7th, 2020.

All protocol modifications and/or deviations must be IRB approved prior to implementation.

If you wish for the study to be re-approved annually[1], please complete the continuing review form on IRBManager, summarizing your use of the protocol during the year no later than 30 days prior to your expiration date; otherwise please submit a Study Closure form prior to the expiration date. If there are any serious adverse events or outcomes related to this study, please notify the IRB immediately.

We look forward to working with you and would like you to present your findings to the Board upon conclusion. If there are any further questions, please feel free to contact me at (406) 257-8992 ext 2265.

Sincerely,

Jeffrey Eshleman MD
IRB Vice Chairperson
(406) 257-8992 ext 2265

[1] Federal Regulations require that all studies be reviewed at least annually. Please take necessary measures to comply with this federal regulation. If there are circumstances that prevent you from submitting the Continuing Review form, please contact the IRB office immediately.

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